REMARKS

Claims 1, 3-7, 10-14, and 16-20 are pending in the present case. Claims 1, 10-14, and 16-20 are amended herein. Claims 2 and 8 are cancelled herein. Applicants respectfully request reconsideration in view of the above amendments to the present application, and the arguments set forth below. No new matter is added herein.

CLAIM REJECTIONS UNDER 35 USC §103

Applicants' arguments of April 1, 2004, relating to various rejections of Claims 1-8, 10-14, and 16-20 under 35 USC §§102 and 103 over US Patent 5,532,715 to Bates (hereinafter Bates) and over Bates in view of US Patent No. 6,433,769 to Cato (hereinafter Cato), are said to be moot. Claims 1-8, 10-14, and 16-20 are now rejected under 35 USC §103(a) over US Patent No. 6,496,177 to Burton (hereinafter Burton) in view of Bates. Applicants respectfully respond herein with the Amendments to the Claims above and the arguments below.

Claims 1, 3-7, & 10-14

Claims 1-3, 5-8, and 12-14 are rejected under 35 USC §103(a) over Burton in view of Bates. Applicants have reviewed the references cited and respectfully assert that Claims 1, 3-7, and 10-14 are allowable over Burton in view of Bates for the following rationale.

Independent Claim 1 is amended herein to read as follows, with underling added for emphasis (independent Claim 10 is amended similarly):

1. In an electronic device having a display and a processor, a method for providing contrast adjustment for said display comprising:

a) receiving a contrast setting that is user defined via a software graphical user interface, wherein said graphical user interface comprises an interactive slide bar and wherein said electronic device comprises a portable hand held computer system;

b) generating signals representative of an ambient temperature of an environment of said display over time, said ambient temperature characterizing said environment;

c) sampling said signals and converting said signals into current temperature values;

d) based on said contrast setting and said current temperature values, computing a first contrast adjustment voltage signal for maintaining said contrast setting, wherein said c) and d) are performed by said processor;

e) automatically adjusting contrast of said display by applying said first contrast adjustment voltage signal to said display; and

f) repeating said b) - e), for a second contrast adjustment, wherein a second contrast adjustment voltage signal is computed and wherein said e) further comprises summing said second contrast adjustment voltage signal and said first contrast adjustment voltage signal.

As amended herein, Claims 1 and 10 relate to portable, hand held (e.g., "palmtop") computer systems having displays, and recite a method for automatic temperature related contrast control wherein, after computing a first contrast adjustment voltage signal by which the computer's display contrast is adjusted, a second contrast adjustment is made. The second contrast adjustment is made to the computer's display contrast with computing a second contrast adjustment voltage signal, which is summed with the first. This is described in the specification, e.g., from lines 1-12 at page 19.

Handheld, portable computers can be and are often used in a variety of environments, which may have ambient temperatures that differ, perhaps widely, one from another. Using such a computer in an environment that exposes the computer's display to one ambient temperature and then, while still using the portable computer, changing the location of such use to another that exposes the computer's display to an ambient temperature different from the first can change the contrast of the computer's display due to temperature related voltage variations.

Such a change can cause confusion, misoperation of the computer (possibly with resulting data loss, network link termination, or other problems), require user attention, which can be inconvenient and annoying, or other problems. Automatic contrast control, e.g., by computing the contrast adjusting voltage setting, as applied to a portable, handheld computer is useful for preventing such user-vexing problems. Further, computing the contrast adjusting voltage setting as the ambient temperature changes, as recited in Claims 1 and 10, wherein a first contrast adjusting voltage setting is computed and then, as the temperature changes, a second contrast adjusting voltage setting is computed and summed with the first to control the contrast of the computer's display has the advantage of temperature compensation continuity, e.g., continuous contrast adjustment as the ambient environmental temperature to which the display is exposed changes.

Providing automatic contrast control for a portable, hand held computer display with computation of the contrast adjusting voltage setting as the ambient temperature changes wherein a first contrast adjusting voltage setting is computed and then, as the temperature changes, a second contrast adjusting voltage setting is computed and summed with the first to control the contrast of the computer's display, as recited in Claims 1 and 10, provides temperature compensation continuity and

differs from the teachings of the cited references. These differences are discussed as set forth below.

As Applicants understand the reference, Burton teaches that the invention described therein "is directed to a liquid crystal display (LCD) temperature compensation control apparatus." Burton: C.2, ll.34-36; C.5, ll.40-42. Burton also teaches that:

> [t]he invention controls the contrast in which data is displayed on certain LCD devices based on ambient temperature such that data can be displayed with a sufficient contrast *while the LCD is subject to ambient temperatures significantly greater than the standard, manufacturer-specified operational temperature range* and/or improved contrast when the ambient temperature is within the standard temperature range.

Id. at C.5 ll. 42-50, italics added for emphasis. Burton defines contrast ratio as the ratio of LCD luminance with all pixels rendered white to the luminance with all pixels rendered black, explains that contrast ration "depends primarily upon ambient temperature and contrast voltage," and that "[t]he operating range of [an] LCD device with regard to the relationship between a contrast voltage and ambient temperature to achieve a desired contrast ratio is typically set forth in ... specifications" (Id. at C.6, ll.11-20) "established for operating" the LCD device. Id. at ll. 6-7. Burton teaches that typical "conventional systems set the contrast voltage to a value that achieves a desired contrast *ratio* when the LCD device is operated in the *anticipated* ambient temperature. The operator is generally able to make adjustments through the use of a contrast adjustment control." Id. at 20-25, emphasis added.

Burton's Figure 1B graphs the standard operating range (Burton's element

102), shown in Figure 1A therein, and another operating range (Burton's element 112) "separate and distinct" therefrom, which "is effective for ambient temperatures that *preferably overlap* those of standard operating temperature range 102, and at least extend beyond the high temperature limit ... of [the] standard operating range." The extended operating range taught has upper and lower boundaries defining "the region of ambient temperature and operating voltage at which the contrast ration of the LCD device is a value that enables the displayed data to be *at least somewhat visible*." Id. at C.8, ll.18-33; emphasis added.

Burton proceeds to expressly teach that "the present invention takes advantage of these *dual operating modes*, controlling the LCD device such that the contrast voltage 103 operates within a specified one of the two operating ranges 102, 112 to *achieve an optimum contrast ratio* for a given ambient temperature." Id. at ll.34-39; emphasis added.

Applicants thus understand Burton to expressly teach optimizing the contrast ratio according to which of two contrast voltage/ambient temperature operating ranges, one standard and the other extended temperature with respect to the first. Applicants further understand Burton to teach adjusting the frame rate with which data is displayed to accommodate the extended operating range (Id. at C.9, ll.7-40) and "inversion" (effectively a reversal of pixel states with respect to white and black) control according to these operating modes. Id. at ll.41-65.

Burton teaches that a contrast controller (element 202 therein) "generates [the] contrast voltage 103" and that this contrast voltage determines the contrast ratio with which [the] LCD device ... displays data." (The contrast controller can also control the frame rate and inversion state). Id. at C.10, ll.11-23. Burton teaches that the

LCD contrast controller determines "whether [the] contrast voltage ... is to be controlled in accordance with the standard operational mode, such as, [e.g.,] along normal temperature operating curve 120; or extended operating mode, such as [e.g.,] along high temperature operating curve 122." This relationship, between the different operating curves - a "normal range" and a "high temperature range" are what Burton expressly teaches is maintained as a data structure by the LCD contrast controller, e.g., in a lookup table. Id. at ll.35-49.

Burton teaches, in step 506 therein, that the "contrast voltage 103 follows normal operating curve120 and high temperature operating curve 122, *transitioning between the two* in accordance with transition temperatures 124 and 126. *This relationship* (i.e., the separate normal and high temperature curves and the transition temperatures) may be maintained ..." Id. at C.13, ll.25-35, emphasis added. Thus, Applicants understand Burton throughout to be teaching a transition between display contrast operating curves. However, Applicants find no teaching or suggestion within the reference directed towards providing automatic contrast control for a portable, hand held computer display with computation of the contrast adjusting voltage setting as the ambient temperature changes wherein a first contrast adjusting voltage setting is computed and then, as the temperature changes, a second contrast adjusting voltage setting is computed and summed with the first to control the contrast of the computer's display, as recited in Claims 1 and 10, which provides contrast temperature compensation continuity.

Therefore, Applicants respectfully assert that Burton does not teach or suggest the embodiments recited in Claims 1 and 10 and their respective dependent claims. Further, in its express teaching of transitions between normal and high temperature operating curves according to discrete transition temperatures,

Applicants respectfully assert that Burton teaches away from the embodiments recited in Claims 1 and 10, which relate to contrast temperature compensation continuity.

Applicants respectfully maintain the remarks and arguments made relating to the Bates reference in the Response filed April 1, 2004. As Applicants related therein, the reference is understood to teach a visually aging scroll bar on the window of a computer display with a slider that indicates the relative positioning of the window of a document, such as a data, image, audio, or text file, or a spreadsheet. Bates, Abstract. Bates expressly states that the principle object of the invention taught therein is to enhance the operation of the scroll bar. Id. at C. 2, ll. 37-38. Bates expressly states that other objects of the invention taught therein are to provide an enhanced scroll bar to allow users to quickly find a specific portion of the document (Id. at ll. 39-41) and to ease finding a specific portion of the document that has been viewed frequently or for long periods of time. Id. at ll. 42-45. Importantly, Bates fails to teach or suggest contrast adjustment in response to measured environmental temperatures, as claimed herein.

Bates teaches a "visually aging scrollbar," taught therein as associated with the window displayed by the computer, which has "a slider to indicate relative positioning in the window of the document." Id. at ll. 40-54. Bates goes on to teach that the computer monitors the position of the scroll bar slider, and after a sampling period elapses, creates a first region matching the current scroll bar position, the visual appearance of the corresponding region is "determined by a predetermined region heating rate." Id. at ll. 53-60. However, all references therein to "temperature" or "heat" are merely symbolic and are meant to symbolize the frequency in which the

document passage is encountered by the user, and has nothing to do with ambient environmental temperature.

According to Bates, after a second sampling period elapses, Bates teaches checking the scroll bar slider position and, where its current position matches the first region, changes the visual appearance of the first region, which "*symbolically* 'warms up'" and incrementally changes the appearance "for as long as the current slider position matches the first region, up until a maximum region *symbolic* 'temperature' is reached. Id. at C. 2, l. 61-C.3, l. 3; italics added herein for emphasis; internal quotation marks in original as normal quotation marks.

Applicants respectfully point out that the temperature Bates teaches is merely symbolic; it does not apply to a physical environmental operating temperature. What Bates teaches as "temperature" and "heating" is in reality the frequency of usage, meaning the extent of the period of time a certain region or portion of a document is displayed on the monitor. This is clearly and expressly taught by Bates throughout the Summary of the Invention thereof (Id. at C. 2, l. 35-C. 3, l. 30), and in the Description of the Preferred Embodiment thereof, from Column 4 at line 45 throughout. In fact, Bates' Claims 1 and 7 expressly recite this teaching (Id. at C. 13, ll. 6-9 and C. 14, ll. 12-15, respectively); Bates' Claim 9 expressly recites this teaching in its seventh method step clause (Id. at C. 14, ll. 48-50); Bates' Claims 11 and 12-13 expressly recite this teaching in their fourth, and second elements, respectively (Id. at C.15, ll. 15-18; C. 16, ll. 3-5 and 19-22, respectively).

Importantly, Bates fails to teach or suggest any contrast adjustment performed in response to any measured physical temperature, as claimed.

Claims 1 and 10 recite generating signals representative of an ambient temperature of an environment of the display over time, the ambient temperature comprising a actual or physical temperature characterizing the environment of an electronic device. The embodiments recited in Claim 1 and 10 differ from the teaching of Bates, which is directed towards a symbolic use of a temperature and heating analogy for the frequency and/or time of usage of a document passage.

The contrast setting of display units in an electronic device can vary with temperature. This can hamper or otherwise adversely effect the use of the electronic device. For instance, where a user of an electronic device emerges from an air conditioned building lit only by interior lighting, outside into a warm, bright, sunny day, or from a well lit heated building into a cold winter night lit only by street lighting, the contrast setting of the device display can be hampered and/or require the user to adjust the contrast to continue convenient operation of the device. The embodiments of the present invention recited in Claims 1 and 10 are directed towards generating signals representative of an ambient temperature of an environment of the display over time, the ambient temperature comprising an physical temperature characterizing the environment of an electronic device function to automatically correct the contrast setting thereof where the ambient temperature of the device's display operating environment changes. This can ease the operation of the electronic device and provide great convenience for a user thereof.

Further still, Bates throughout is directed towards a non-portable computer system, which teaches away from the portable hand held computer device recited in Claims 1 and 10. See, e.g., Bates' Figure 1, wherein Bates' keyboard, mouse, and display (Bates' elements 18, 19, and 17, respectively) are separate from Bates' "system unit" (Bates' element 11).

At no place in the cited reference can Applicants find any teaching or suggestion for the automatic correction of the contrast setting of an electronic device where the physical ambient temperature of the device's display operating environment changes, as recited in Claims 1 and 10 of the present invention. Thus, Applicants respectfully assert that Bates does not anticipate or suggest Claims 1-2, 5-6, 10, and 12-13.

Applicants further respectfully assert, first, that in teaching a visually aging scroll bar for affecting contrast to display a symbolic temperature indicative only of the frequency and/or time of usage of a document section expressly teaches away from the embodiments of the present invention recited in Claims 1 and 10, which are directed towards automatically correcting the contrast setting of an electronic device's display where the physical ambient temperature of the display operating environment changes. Secondly, Applicants respectfully further assert that the visually aging scroll bar taught by Bates for affecting contrast to display a symbolic temperature indicative only of the frequency and/or time of usage of a document section will not work to automatically correct the contrast setting of an electronic device's display where the physical ambient temperature of the display operating environment changes, as do the embodiments of the present invention recited in Claims 1 and 10. Bates further teaches away from the recited embodiments in that it is directed to a non-portable computer.

Burton does not cure these defects of Bates and Bates does not cure the defects of Burton, discussed above. Applicants respectfully assert therefore that, combined or separately, the references do not teach or suggest the embodiments recited in Claims 1 and 10 and their dependent claims, and in fact expressly

teach away therefrom. Thus, Applicants respectfully assert that Claims 1-3, 5-8, and 12-14 are allowable over Burton in view of Bates under 35 USC 103(a).

Claims 4, 11, & 16-20

Claims 4, 11, and 16-20 are rejected under 35 USC 103(a) over Burton in view of Bates, further in view of US Patent No. 6,433,769 to Cato (hereinafter Cato). Applicants have reviewed the references cited and respectfully assert that Claims 4, 11, and 16-20 are patentable over Bates in view of Cato under the statute for the following rationale.

Like Claims 1 and 10, upon which Claims 4 and 11 respectively depend, independent Claim 16, which also relates to portable, hand held (e.g., "palmtop") computer systems having displays, is amended herein to recite a method for automatic temperature related contrast control wherein, after computing a first contrast adjustment voltage signal by which the computer's display contrast is adjusted, a second contrast adjustment is made. The second contrast adjustment is made to the computer's display contrast with computing a second contrast adjustment voltage signal, which is summed with the first. Further, the method for automatic temperature related contrast control recited by Claims 1, 10 and 16 all relate to a software graphical user interface displayed on the computer's display.

Issues of size, related component density and weight, and costs relating to component procurement and assembly are significant issues to users and makers of portable hand held electronic computers, wherein these factors are at a premium, rendering it desirable to reduce weight, reduce size and concomitantly increase component density, and reduce costs. Costs can be reduced by eliminating, where possible, components that would otherwise have to be purchased. Eliminating such

components can further reduce costs by simplifying assembly (e.g., the eliminated components no longer need installation during assembly). Performing the contrast adjustment function using a software GUI as recited in Claims 1, 10, and 16, space and weight is saved. This is because physical components (e.g., a variable resistor) (such as those taught by Cato) to do so are obviated. The space saved allows size reduction or the possibility of increased functionality, such as "recycling" the saved space for use with other components. Obviating the physical contrast control component (e.g., the variable resistor, taught by Cato) eliminates having to either purchase or install them, thus saving costs.

Applicants respectfully repeat the arguments above in relation to Burton and Bates. As discussed in the April 1, 2004 Response (and parenthetically in the previous paragraph), Applicants understand the Cato reference to expressly teach including a variable resistor 206 (Cato, C. 3, ll. 16-18) for optionally varying a reference voltage to "keep a set contrast at a user's desired value" (Id. at ll. 26-27). However, Applicants find no teaching or suggestion therein directed towards performing this function with software control. In fact, in teaching that these functions are performed with discrete hardware components, Cato expressly teaches away from the embodiments of the present invention recited in Claims 1, 10, and 16, which relate to software (e.g., GUI) control.

Burton does not cure the defects of Bates or Cato, Bates does not cure the defects of Burton or Cato, and Cato does not cure the defects, discussed above, of Burton or Bates. Applicants respectfully assert therefore that, combined or separately, the references do not teach or suggest the embodiments recited in Claims 1, 10, and 16 and their dependent claims, and in fact expressly

teach away therefrom. Thus, Applicants respectfully assert that Claims 4, 11, and 16-20 are allowable over Burton in view of Bates, further in view of Cato under 35 USC 103(a).

CONCLUSION

By the rationale stated above, Applicants respectfully assert that Claims 1, 10, and 16 and their respective dependent claims are not taught or suggested by any of the cited references, alone or in any combination, which all in fact teach away from the claimed embodiments. Thus, Applicants respectfully assert that Claims 1, 3-7, 10-14, and 16-20 are allowable over the cited references under 35 USC 103(a). Accordingly, Applicants respectfully request that the rejections to Claims 1, 3-7, 10-14, and 16-20 be withdrawn and that these Claims be allowed.

Please charge our deposit account No. 23-0085, for any unpaid fees.

Respectfully submitted,

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